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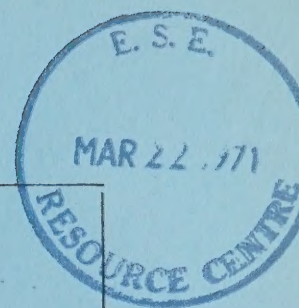
Working Paper No.16

SUGGESTIONS FOR COMPARATIVE FIELD OBSERVATIONS ON

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ON NATURAL HAZARDS

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Working Paper No. 16

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ON NATURAL HAZARDS

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Gilbert F. White
Institute of Behavioral Science
University of Colorado
Boulder, Colorado 80302
U.S.A.

Robert W. Funes
Graduate School of Geography
Clark University
Worcester, Massachusetts 01601
U.S.A.

Law Austin
Environmental Science and
Engineering Program
University of Toronto
Toronto 181, Ontario
Canada

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PREFACE

This paper is one in a series on research in progress in the field of human adjustments to natural hazards. It is intended that these papers will be used as working documents by the group of scholars directly involved in hazard research as well as inform a larger circle of interested persons. The series is now being supported from funds granted by the U. S. National Science Foundation to the University of Colorado, Clark University, and the University of Toronto. Authorship of papers is not necessarily confined to those working at these institutions.

Further information about the research program is available from the following:

Gilbert F. White
Institute of Behavioral Science
University of Colorado
Boulder, Colorado 80302
U.S.A.

Robert W. Kates
Graduate School of Geography
Clark University
Worcester, Massachusetts 01610
U.S.A.

Ian Burton
Environmental Science and
Engineering Program
University of Toronto
Toronto 181, Ontario
Canada

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SUGGESTIONS FOR COMPARATIVE FIELD OBSERVATIONS ON NATURAL HAZARDS

The purpose of this working paper is to outline a procedure for observing a natural hazard in a local area so as to provide a basis for comparative analysis of man's adjustment to hazard situations in a variety of cultural and physical conditions. It is hoped that investigators will use the methods described here as a basis for field observations which then may be compared with those from other areas as a means of testing and refining certain general hypotheses about the ways in which man copes with hazard in the natural environment.

Aims

It is hoped that each set of field observations will, as a minimum, cover the information defined here. However, it is expected that each area will have its peculiarities which will dictate the addition of other information or the specification in some detail of what otherwise would be general questions. Thus, the results of all studies following this procedure should yield certain types of essential data in common and should vary from one area to another in the character of additional data.

The general background for the comparative study is given in Working Papers No. 1 and 14 (Burton, et al., The human ecology of extreme geophysical events, 1968; Kates, Natural hazard in human ecological perspective: hypotheses and models, 1970). One way in which the results may be put to broader use is described in the Circular Letter No. 2 of the IGU Commission on Man and Environment.

It is believed that the full set of observations will throw new light on the variety of human adjustments of hazards. It also should test the validity of certain working hypotheses and suggest some new ones. Among the principal hypotheses that are under investigation are the following:

- A. Human occupancy that persists in areas of recurrent hazard has good reason to be there in the view of the occupants. Such reasons include:

Superior economic opportunity;
Lack of satisfying alternative opportunities;
Short-term time horizons;
High ratios of reserves to potential loss.

- B. There are three types of response to natural hazards which may be characterized as:

1. Folk, or pre-industrial, adjustments which involve a wide range of adjustments requiring more modifications in behavior in harmony with nature than control of nature, are flexible and easily abandoned, are low in capital requirements, require action only by individuals or small groups, and can vary drastically over short distances.
2. Modern technological, or industrial, adjustments which involve a more limited range of technological actions emphasizing control of nature, are inflexible and difficult to change, are high in capital requirements, require interlocking and interdependent social organization, and tend to be uniform.
3. Comprehensive, or post-industrial, adjustments which combine features of both earlier stages so as to involve a larger range of adjustments, greater flexibility and variety of capital and organizational requirements.

- C. Variation in hazard perception and estimation can be accounted for by a combination of the following:

1. Magnitude and frequency of the hazard;
2. Recency and frequency of personal experience, with intermediate frequency generating greatest variation in hazard interpretation and expectation;
3. Importance of the hazard to income or locational interest; and
4. Personality factors such as risk-taking propensity, fate control, and views of nature.

This variation is not related to common socio-economic indicators such as age, education, and income.

- D. For individuals, the choice of adjustment is a function of:

1. Perception of the hazard,
2. Perception of the choice open to them,
3. Their command of technology,
4. The relative economic efficiency of the alternatives, and
5. The perceived linkages with other people.

- E. For individuals, the process of estimating economic efficiency is related to the perceived time horizon, the ratio of reserves to anticipated loss, and the degree to which choice is required.
- F. For communities, the choice of adjustment is a function of perception of hazard, choice, and economic efficiency as influenced by the stability and the power structure of government.

The model presented in Working Paper No. 14 suggests the way in which these factors are inter-related in the decisions made by people coping with hazard in the environment. The field observations do not permit a rigorous testing of all of those relationships, but many of them are subjected to examination. Investigators are encouraged to look for other, more imaginative ways to test their validity in the areas under study.

The hypotheses stated are not inclusive but they suggest the chief questions which it is hoped to explore in the observations outlined on the following pages. All investigators are invited to assess, revise, and add to these hypotheses.

The observations should comprise 1) a description of the study site, and 2) a basic interview with a sample of about 120 households, including the administration of a sentence completion test.

The findings from the observations may be expected to be useful in several ways. Within each study site they should stimulate awareness and appraisal of the range of opportunities that people have open to them in dealing with natural hazard. At the national level, they may help national or regional governments consider the effects of changes in policies for reducing or managing the damages from such hazard. At the international level, they may assist United Nations organizations in taking account of the likely consequences of new information or new technical services related to environmental hazards. It is planned to bring together summaries of the findings at a meeting of the IGU Commission on Man and Environment in Calgary during the last week of July, 1972. From that meeting a volume of findings probably will be published. Those findings will also be helpful in preparing a smaller interpretive book on local as well as national studies of hazards in nature.

Site Description

The observations should include a series of descriptions of the site to give a framework within which the data from the interviews can be interpreted. Investigators will have to judge how much information is essential to understanding the variations in hazards and adjustments to them, but the following are suggested as a minimum, inserting references where appropriate. Wherever practicable, these should be shown on maps of the area.

- A. Distribution of landforms.
- B. Distribution of soil or vegetation types, as appropriate.
- C. Distribution of major types of land use (types of farming if a farming area, and predominant economic use in the case of urban areas) and of population (including ethnic group if there is any variety).
- D. A review of the sequent occupance of the area, indicating what appears to account for changes in use over time.
- E. An estimate of the mean and range of annual income for the group of people from whom interviews are obtained.
- F. Location and duration of nearest observing stations for which data on the selected natural hazard may be obtained, including the availability of data.
- G. As precise information as can be assembled as to the real extent of the areas subject to damage for particular hazard events.
- H. A record of the historical occurrence of the hazard, and an estimate of its recurrence interval for selected magnitudes.
- I. An estimate of the damage caused by one or more natural events, including the monetary losses and the loss of life.
- J. A judgment as to the importance of the particular natural hazard to the economy and social organization of the region and of the nation.
- K. An annotated list of all the adjustments to the hazard which are known to be practiced in the area, together

with any other adjustments thought by the investigator to be applicable. The notations should indicate whether or not the adjustment is practiced, any available information as to its costs and benefits, any action taken by the government to either encourage or discourage, and whether or not it requires collective action.

- L. A comment on the flexibility of adjustments and the ease with which they may be abandoned.
- M. A brief description of the circumstances in which people in the area make decisions about the ways in which they cope with hazards. This should indicate whether or not they are required by conditions to exercise any choice (a farmer must choose seed each year but a homeowner is not obliged to repair his house unless it is damaged or deteriorated), and what other people are involved in the decision.
- N. A description of other natural hazards which are significant in the area.
- O. Any other general information the investigator may consider significant, including the estimated capital expenditures which have been made to deal with the hazard under study.
- P. A statement as to how the study area resembles or differs from the larger region of which it is a part.

A national location map and a more detailed site map or aerial photo at a scale of 1:10,000 or 1:20,000 should be included. A small-scale map should show the location of the study area in the region.

In dealing with different cultures and languages it is important to be clear as to the meaning of the words used. Translating a term from one language to another and then back again may help reveal differences in connotations.

Basic Interview

It is expected that the sampling procedure for selection of households for interview will be approximately the same in all study sites, but that changes will be made in the questionnaire on the basis of exploratory testing. The interview questions should be tried with at least ten households before final use in order to be certain that wording and usage correspond with local conditions.

Sampling

In order to have an adequate sample for testing the major relationships, it is necessary to obtain valid and complete interviews from 120 households in a relatively compact area.

These should be selected within an area having at least one distinct natural hazard, such as drought, earthquake, flood, or snow. Only one hazard should be selected.

All the respondents should either be agricultural or non-agricultural. In some areas it may be impossible to draw clear distinctions.

If there is any zonation in the area according to intensity of the selected hazard, as for example in a depth of flooding in a flood plain or in droughtiness of soils on a mountain slope, households should be selected on the following basis. If only one zone is studied it should be one of high or medium hazard. If two zones can be studied as separate sites, one should have high hazard and the other either medium or low hazard. If three zones can be studied as separate sites, then one site each should have high, medium, and low hazard.

Interviews should be sought only with heads of households who are married and have children.

Among these the individuals should be selected so that, if practicable, there are equal numbers in each of the following categories:

- | | | |
|-------------------------------------|---|---|
| With all children below working age | - | Illiterate |
| With all children below working age | - | Literate but no schooling above 5 years |
| With all children below working age | - | Literate with 6 or more years of formal schooling |

- | | | |
|-----------------------------------|---|---|
| With some children of working age | - | Illiterate |
| With some children of working age | - | Literate but no schooling above 5 years |
| With some children of working age | - | Literate and with 6 or more years of formal schooling |

The purpose of stratifying the interviews in this fashion is to permit comparison between respondents according to their education and their family responsibilities.

It may be more suitable to classify education according to other criteria that accurately describe differences in educational level in the particular culture. Thus, the level of formal schooling required to provide skills necessary to hold simple clerical jobs is a critical point and may be more or less than the six years suggested above. If all or most of the households in a study area are in one educational class, as when all are illiterate or all have schooling above the elementary level, then the division should be according to estimated income so that, relative to the prevailing conditions in the area, one third of respondents are in the low income group, one third in the middle, and one third in the high.

Where there are not enough households to fill the quota of 20 for each of the six categories described above, choose households in other categories and give the returns for those available. For example, if there are only five families with children below working age and with more than five years of formal schooling, these should be interviewed and 15 other families with young children and with lesser schooling should be interviewed.

General Questionnaire

A questionnaire designed to elicit information which would help test these hypotheses is given in a general form. It covers the major types of relevant data from an interview and seeks to record it in a convenient and accurate way. Wherever practical the answers are arranged so that they will not require transcription for data processing and so that any judgments are made in the field.

Each box should be filled in. If the answer is none, a zero, "0" should be entered. If no response is obtained, an "X" should be entered.

Code numbers are assigned to countries, places, interviewers, religions, and languages.

Where there is a choice among several answers enter a "1" in boxes which are positive, and a zero, "0" in boxes which are negative.

The general questionnaire is designed for both farmers and non-farmers. Some questions apply to both. Those applying only to one or the other are labeled "F" for farm and "NF" for non-farm.

No formal interviewing should be undertaken until after the questionnaire has been tried by the investigator and others who expect to assist him in the interviews. They should ask themselves whether or not the questions are understandable and accurately phrased to meet local conditions. Having modified the language in ways to make it more nearly clear, they then should try it out with selected households and interviewers. In the light of that experience the questionnaire again should be revised in the interest of clarity.

All of the questions presented here have been tried in a variety of cultural settings. Generally, they have given satisfactory results. However, it is likely that in some situations they will require modification. Investigators should feel free to make additions or changes, but are encouraged to retain as much of the original wording as seems acceptable.

Where a major change is made in a question or where a new question is added, a note of explanation should be inserted in the site description.

Every one of the questions is intended to obtain information relevant to one or more of the hypotheses stated above. Thus, it has been found in some studies that the number of adjustments perceived by a respondent is associated with age, and both facts are solicited. It is expected that relationships will be found among the character of the hazard (frequency, time of occurrence, losses, etc.), the experience of the respondent (his exposure to the hazard, his awareness of it, etc.), and the kinds of adjustments he makes to the hazard (number of adjustments perceived, type of action taken, etc.).

The sentence completion test is a measure of certain personality traits, and these may be expected to be associated with the kinds of action taken when a hazard threatens. It is recommended that before the field interviewing begins the investigator review the questionnaire with the interviewers and ask them to suggest the possible significance of each question so that they understand why it is being asked.

It also would be useful to review the completed questionnaires at the end of each day of interviewing in order to make certain that the same interpretations are given to similar responses.

The wording in the general questionnaire refers to "drought" and "hurricane". This, of course, would be changed to conform to the particular hazard under study.

Items for a General Questionnaire

1. Date [][][][][]
2. Country [][][][][][]
3. Study site [][][][][]
4. Location [][][][][]
5. Severity of hazard [] High [] (Estimate by interviewer)
Medium []
Low []
6. Number of interviewer [][]
7. Number of respondent [][]
8. Sex of respondent []
9. Occupation (major source of income)
F* Farmer [] Pastoralist [] Other [] Government []
NF Artisan [] Tradesman [] Laborer [] Retired []
Education [] Manufacturer [] Unemployed []
10. Tenure of land or home (cross out one if it does not apply)
Owner [] Tenant [] Shifting [] Communal []
Laborer []
11. Predominant language spoken in household [][]
12. Religion [][]
13. Age of respondent in years [][] (Estimate, if necessary)
14. Number, age and sex of person\$in household

Age	Male	Female
Over 21	[][]	[][]
16 - 21	[][]	[][]
0 - 15	[][]	[][]
Total	[][]	[][]

NF If business firm, number of employees
15. Literacy []
 Cannot read []
 Read but less than 6 years formal schooling []
 Formal schooling of 6 years or more []

* F = Applicable to Farmers
 NF = Applicable to Non-Farmers

16. What are the principal disadvantages in living in this building, or working this field? What are the principal advantages?
- a. Emphasis on: Advantages ☐ Disadvantages ☐ Neither ☐
- b. List any hazards (social or natural) noted by respondent _____
-
17. What are the principal disadvantages in living in this area? What are the principal advantages?
- a. Emphasis on: Advantages ☐ Disadvantages ☐ Neither ☐
- b. List any hazards (social or natural) noted by respondent _____
-
18. Do the people of this place have any trouble with (drought, hurricanes, etc.)?
- Yes ☐ Doubtful ☐ No ☐ Don't know ☐
- (Insert Sentence Completion Test here)
19. If by some misfortune this area is affected by (a drought, a hurricane) in what way do you think it would affect your household?
- a. List any effects volunteered by respondent
- | | | | |
|-----------------------|--------------------------|----------|--------------------------|
| Structure | ☐ | Anxiety | ☐ |
| Nothing | ☐ | Contents | ☐ |
| Other property | ☐ | Activity | ☐ |
| Other (specify) _____ | | | |
- b. Are the damages considered to be:
- | | | | |
|-------------------|--------------------------|------------------------|--------------------------|
| Total (80 - 100%) | ☐ | Substantial (21 - 79%) | ☐ |
| Slight (1 - 20%) | ☐ | Non-existent (0%) | ☐ |
- c. What are the major damages?
- | | | | |
|-----------------------|--------------------------|--------------|--------------------------|
| F House and buildings | ☐ | NF Workplace | ☐ |
| Crops | ☐ | House | ☐ |
| Animals | ☐ | Community | ☐ |
| People | ☐ | People | ☐ |
20. How many times have (droughts come, there been hurricanes, etc.) in this area in the years since you were born? ☐ ☐ ☐
- List years _____
21. When was the worst year for (drought, hurricanes, etc.)? ☐ ☐ ☐ ☐
22. When was the last year when there was trouble with (drought, hurricanes, etc.)? ☐ ☐ ☐ ☐

23.a. Do you think the (drought, hurricane, etc.) will come again in your lifetime?

Yes ☐ Don't know ☐ No ☐

b. If yes, soon? ☐ In a few years? ☐ In many years? ☐

24. Do people in other places have trouble with (drought, hurricanes)?

Yes ☐ Doubtful ☐ No ☐ Don't know ☐

25. Are there other places with fewer (droughts, hurricanes) where you could earn as good a living?

Yes ☐ Doubtful ☐ No ☐ Don't know ☐

26. Here is a story on which we would like your comments.

Once after (a drought, hurricane) four men spoke about (the rains coming late, a hurricane coming again).

The first said that the (late rains, hurricane) would come again soon because when (late rains, hurricanes) happen, more are soon to come.

The second thought that (late rains, hurricanes) would come again but did not know when because (late rains, hurricanes) can happen in any year.

The third said that he knew when the (late rains, hurricanes) would come for there is a regular time and that time must pass before it comes again.

The fourth thought that the (late rains, hurricanes) would not come again.

Which man had the best idea about the coming of (late rains, hurricanes)?

First ☐ Second ☐ Third ☐ Fourth ☐ Don't know ☐

27. How many years have you worked in this place? ☐ ☐ ☐

28.a. Do you think you will live in this building (or work in this place) many more years?

Yes ☐ Doubtful ☐ No ☐ Don't know ☐

b. If the answer is "Doubtful" or "No", where do you think you would move?

Same hazard zone ☐ Different region ☐

Different zone ☐ Different country ☐

29. During the years you have worked here how many years would you say have been for your (harvest, business, etc.)?

Good ☐ ☐ ☐ By "good", we mean in terms of your income.

Bad ☐ ☐ ☐

Regular ☐ ☐ ☐

30. When you want to talk over an important community problem, to whom do you speak? (Give an example of such a problem in that community)
- Family ☐ Friend ☐ Special group or person ☐ (Specify _____)
- Government ☐ No one ☐ (Example) _____
31. If you have problems after (a drought, a hurricane, etc.) occurs, who can you go to for help in recovering from the losses?
- Family ☐ Friend ☐ Special group or person ☐
- Government ☐ No one ☐ How do they help? _____
32. How successful have such people been in helping you recover your losses?
- Completely ☐ Don't know ☐ Somewhat unsuccessful ☐
- Somewhat successful ☐ Unsuccessful ☐
33. Do you know anyone who has been helped by the government because of (drought, hurricane, etc.)?
- a. No ☐ Yes ☐
- b. If yes, explain how _____
34. Are there any signs or ways of knowing when a (drought, hurricane, etc.) will come again?
- a. Yes ☐ No ☐ Don't know ☐
- b. If yes, explain _____
35. When a (drought, hurricane, etc.) comes, what do you do?

(List Adjustments)*	Mentioned by Respondent	When Asked		Different Next Time		Warning Given	
		Yes	No	Yes	No	Yes	No
	(1)	(2)		(3)		(4)	
A ₁	☐	☐	☐	☐	☐	☐	☐
A ₂	☐	☐	☐	☐	☐	☐	☐
A ₃	☐	☐	☐	☐	☐	☐	☐
A _n (as many as re- quired)	☐	☐	☐	☐	☐	☐	☐

First, let respondent volunteer and record in Column (1). Then ask about others and record in Column (2).

*For example "Move out of Building", "Buy provisions", etc.

36. Next time, would you do anything any different than you did last time? (Record in Column (3) above.)
37. If a warning were to be given that a (drought, hurricane, etc.) is coming this year, would you do anything any different? (Record in Column (4) above.)

38. What do your neighbors do? (Record in Column (1), then ask and record in Column (2).)

	(1)	(2)		(3)			(4)							
	Mentioned by Respondent	When Asked Yes	No	Good	Bad	Don't Know	1	2	3	Why? 4	5	6	7	8
A ₁	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
A ₂	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
A ₃	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
A _n	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]

39. a. About these things that you and your neighbors do, do you think they are good or bad? (Record in Column (3).)

- b. Why? (See code below for response to 39 b.) Record in Column (4).)

1. Has not heard of adjustment.
2. Thinks the local environment is favorable or unfavorable.
3. Doesn't know how to do it.
4. Thinks it would pay or would not pay.
5. Cannot afford it.
6. Is encouraged or discouraged by the effect it would have on other people.
7. Doesn't think it will work.
8. Other

40. a. Do you try to carry any (F crops - NF money) over from one year to the next year? Yes [] No [] Don't know []

- b. If yes, about how much do you carry over in a good year? _____

- c. In a bad year? _____ (Express as percentage of income)

41. a. Is there anything that the government or people, your friends and neighbors, can do to prevent damage from a (drought, hurricane, etc.)?

Yes [] Don't know [] No []

- b. If yes, specify _____

42. On the basis of your annual income, in which of the following classes do you consider yourself?

Currency Unit

_000 - _000 [] (High) (classes to be set by local conditions)

_00 - _000 [] (Medium)

- - _00 [] (Low)

No response []

Interviewer's Comments (to be completed after interview)

Estimated income in relation to mean for group

High []

Medium []

Low []

Interview situation:

Alone []

Group []

Respondent's attitude:

Hostile [] Neutral [] Helpful []

Unreliable [] Reliable []

Exploratory Use

By exploratory use of the general questionnaire, greater precision can be reached in dealing with problems in their local context. It is important to explain in an accompanying note precisely why an addition is made to a general question.

One of the important problems of language has to do with the description of hazard. Two people may use the term "drought" or "flood" quite differently. Be certain to include precise definitions of the terms as used in the study area. The exploratory work with the questionnaire should reveal the different connotations, one should be selected, and then a single definition should be incorporated in the questionnaire or given in an introductory statement. Similarly, other terms may require explicit definition to fit the circumstances of a particular area.

A number of the questions are stated in general terms to assist in gaining the widest coverage in response. However, once the question has been put to a trial group of respondents it may be stated much more explicitly, thus gaining in detail and still enabling the results to be compared with those from other areas. For example, the general questionnaire when tried with drought adjustments of peasant farmers in Yucatan was modified at several points. The number of adjustments practiced by the farmers was determined and each then was described in some detail. This made it possible to rephrase question #34 as shown in the following section of a questionnaire used in a Yucatan drought area.

Sample of Specified Questionnaire Sections

In some areas the known methods of forecasting a natural occurrence may be very limited. Thus, in Yucatan, all peasants know of only one means, a folk method, called the "cabanuelas" which links subsequent weather with the weather during the month of January. In this case it seemed right to add to No. 34, "Do you believe in the cabanuelas?" Yes, No. The beginning of No. 37 then was modified to read "If the cabanuelas were to signal a drought for the coming year..."

The list of possible adjustments under No. 35 may be long or short according to local conditions. With Yucatan drought, there were five

principal responses which then were listed on the questionnaire as follows:

Nothing
 Plant the early maturing corn
 Plant more corn
 Look for other work
 Perform (a religious ceremony known as) the Chá-chaac

In attempting to specify the reasons for favoring or opposing various adjustments as shown in No. 38, and in estimating the reserves carried over from one year to another in No. 40, it may be practicable to ask a number of concrete questions about the operation and thus be able to work out a rough calculation of what would be the returns or costs of following particular adjustments. In the case of the Yucatan peasants who supplement maize with a variety of other crops, these questions were expanded to take account of the fact that the different effects would be shown either in returns from crops, principally maize, or from labor performed outside the farm. This led to a series of detailed questions to which answers could be given readily by the peasant.

Alternate 38a. How many mecates (a measure of area) did you plant in 1968 of each of the types of maize and of each of the other crops?

38b. What production did you have from each of these in 1968?

38c. How many units of product would you expect per mecate 1) in a good year, 2) in an ordinary year, and 3) in a very bad drought year?

The answers to these could be recorded in a table as follows:

Crop	<u>If more than 1 mecate</u>			<u>If less than 1 mecate</u>		<u>Expected production per mecate</u>		
	Number	Unit	Product	Total	Product	A good year	An ordinary year	A very bad year

38d. How much of each crop did you sell and in what month?

38e. How much maize did you consume at home, use for animals, pay to others, or carry over?

38f. How many animals do you own? How many did you buy in 1968? Sell in 1968?

38g. How many days did you spend in 1968 on each of specified types of work and what salary did you earn?

38h. Would you work any differently if there were to be a drought? How?

38i. Did you pay anyone to work for you in 1968? How much?

From these responses it is practicable to show the economic effects of different sorts of crop and work adjustments without depending on the respondent's general estimate. Obviously, the form would have to be changed to suit each local situation. When tailored to the operations of local farmers or city dwellers, it may be easier for them to answer the detailed questions than the more general one.

Interview Procedure

For the person who is using interviews for the first time as a tool for research in social science, it may be useful to consider some elementary techniques. We all use questions and answers with our family, friends, and acquaintances to gain information, but communication with them is not always easy, and it is less so in the case of strangers. The impression that the interviewer makes on the respondent has been found to be very important: the quality of the interview depends on whether or not the respondent views the interviewer as a sympathetic and understanding person who can record his answers without seeming to judge or reject them.

The assumption is made here that the interviewer has in hand a well designed questionnaire that has been thoroughly pre-tested on local subjects much like the people he will be interviewing. This means that the questions are likely to mean the same thing to all his respondents, and to lead to the kind of information which can be used to test the hypotheses of the study. He will still need to think of a number of considerations. Some of these are listed below, and others will probably occur to him as he gains experience.

Ethics of interviewing.

Any kind of study which involves human beings as subjects raises the question of safeguards of their rights and well-being. A Clark University statement on policy says that research proposals should be reviewed "to assure that 1) the rights and welfare of the individuals are adequately protected with respect to security, privacy and confidentiality, embarrassment, discomfort, and harassment, 2) the methods used to obtain informed consent are adequate and appropriate, and 3) the risks to the individual are outweighed by the potential benefit to him or by the importance of the knowledge to be gained."¹

The interviewer may often be responsible for getting informed consent from the respondent through his introduction to the questionnaire,

¹Clark University, Committee on Rights of Human Participants in Research and Training Programs, "Guidelines for Investigators and Directors of Research and Training Programs", October, 1969.

where he requests the respondent's cooperation, explains the purpose of the study, and assures him of confidentiality. Once the interviewer has completed a personal interview he needs to remember that all he has heard or observed in the respondent's home is privileged information, whether it came out of the interview itself or from his incidental observations of the respondent's home, family, or friends.

Sampling technique.

The sample called for in the Natural Hazard studies requires six classes of married heads of families, as described in the section on the Basic Interview. Optional ways for the interviewer to locate these people might be: 1) he could go from house to house making a face survey of all the married heads of households in randomly selected blocks for age of children and degree of education, and select from those with the desired characteristics. 2) He could select an informant who knows all the people in a village, who could then be asked to produce individuals conforming to the study requirements. 3) He could attend a meeting where people similar to those he wants might appear. For example, he might attend a men's club meeting, make a quick survey for selected characteristics, and select his sample from the group.

The interviewer needs to be sure he understands the method of sampling, and precise definitions of all the terms used, such as "illiterate".

When the sample has been chosen, it then becomes important to interview each individual selected, something not always easy to arrange. The interviewer must make appointments or other connections with the people, and their availability may limit the number he can reach in a day. He may quickly gain a feel for the best time of day to find people in his particular community. He will also need a firm rule for substitution if it is impossible to reach a selected subject.

Arrangements for the interview.

Permission: there usually is need for the relevant authorities in the community to know that the interviewer is present, and what he is doing. He may need credentials to show.

Introduction: The interviewer should think hard about what kind of an introduction he is going to use, where he says he is from, how he explains the nature of the study, and how he gets the respondent to consent to the interview and the use of the material. If he uses the name of a university he will need to know whether or not people will assume he is connected with the government. In some areas governmental sponsorship may raise visions of tax collection or security agents. He must also consider what sort of expectations he might raise concerning the results of the study.

Place of interview: A room or a house secured by the interviewer is more likely to provide a setting of privacy than the respondent's home, but may have some effect on the respondent with regard to its location and atmosphere. If a more public place is used, the interviewer should be aware of the effect of onlookers and frequent interruptions.

Recording of the Interview.

There are basically three ways to record an interview: a verbatim record on a tape, notes taken during an interview, and notes written after the interview is over. The interviewer has to decide which is feasible and most useful. In the hazard questionnaire much of the material is recorded directly on the form, but the interviewer will have to be alert to comments and additions that illuminate the answers and record them suitably. He will also be able to give attention to local words and phrases which may give difficulty in translation.

Pay versus thanks.

Many people enjoy giving their opinions, and consider the lively interest of a good interviewer sufficient reward for their time. However, if the respondent is a farmer taking time off from his fields this may not be the case. If he is to be paid for his time, the interviewer needs to consider carefully the effect on the person and on the community. Is the pay uniform for all subjects? If not, the word will quickly get around. How much would the man earn in the time lost? - this may be a good guide. If the respondent operates in a subsistence economy, what will be the effect of an intrusion of cash which will not recur?

Training of interviewers.

Role-playing: One of the best techniques for familiarizing oneself or others with a questionnaire is role-playing. This is simple: one person becomes the interviewer and the other a selected subject - farmer, business man, or workman, who tries to answer the questions as he thinks the subject would. This is best done in front of a group who can then analyze the techniques. Was the introduction good? Did the interviewer add comments that changed the meaning of the questions? What kinds of rewards did the interviewer give to the respondent? Did he probe until the respondent fully explained his answer? Were the questions really answered?

Trial interviews: After a period of role-playing and analysis of the results, each person should interview a number of people who will not be in the final sample. These can be friends or anyone who is willing to spend the time. Any questions that arise during this period should be discussed by the whole group of interviewers, if there is one. If possible, a few such interviews could be recorded and played back for analysis by the group.

It is assumed that a uniform method of recording has been agreed upon. At this point it should be used for the trial interviews. If an interview is conducted before a group, everyone can record the data and compare results. This is especially important to get consistency in ratings such as the respondent's attitude, or his income in relation to the mean for the group.

Probes.

Very often a person will not reply fully to a question. The interviewer then has to sit in an uncomfortable silence, or try to get some more information. What should he say next? If he asks "what do you mean by that?", or "could you please tell me more about this", or "please tell me why you think this is so" he would not direct the respondent's thinking, but he needs to think hard before he says anything more. Is it a good idea to use an example? This is discussed at some length in connection with the sentence completion test, but the interviewer must also be careful not to influence the answers on the basic interview.

Sources of bias.

One main source of interviewer bias is the expectations the interviewer has regarding the respondent. If, for example, he assumes that all farmers are inarticulate, he may not get any answers to his questions. Another source may be his own value system, if he imposes this on the respondent by his questions or his general attitude.

Sources of error.

There is much room for interviewer error in the questioning, the probing, and the recording of interview. The last type can best be checked by the interviewer's examining the interview as soon as possible after leaving the respondent. For the first two types of error, standardization of procedures among the interviewers during the pre-testing will probably be of the most help.

Style.

Each person has his own style of interviewing, and it is well to take advantage of your own personality. If people perceive you as a likable young girl or boy, fine. If someone seems a serious professorial type, let him develop that. In other words, be yourself, and don't try to play a role not natural to you, for your respondent will probably be made uncomfortable by this. At its best the interview is a pleasurable experience for the respondent and the interviewer: if you are an impolite, aggressive type perhaps you had better avoid the interview situation. If you try to sympathetically and accurately record what the respondent tells you, the interview can be an exciting and informative experience for both parties.

Readings:

1. Survey Research Center, Interviewer's Manual, Ann Arbor, Michigan: Institute for Social Research, the University of Michigan, 1969.
2. Hyman, Herbert H. Interviewing in Social Research, Chicago: University of Chicago Press, 1954.

Sentence Completion TestStems

The test ordinarily is given orally in the following form.

Directions: I'm going to read you the beginnings of some sentences. I would like you to complete each sentence with whatever comes to mind. There are no right or wrong answers. Just say whatever comes first into your head. For example, how would you finish this sentence: "The thing I like best to eat is..." Good, that's the idea. Now, here is the first one.

1. If a (drought, hurricane) is predicted, I _____

IF NO EXPERIENCE WITH HAZARD: If a (drought, hurricane) were predicted, I would _____

2. The main thing that helps people to get ahead in the world is _____

3. When a (drought, hurricane) is coming, the first emotion I feel is _____

IF NO EXPERIENCE WITH HAZARD: If a (drought, hurricane) were coming, the first emotion I would feel would be _____

4. During a (drought, hurricane) I _____

IF NO EXPERIENCE WITH HAZARD: During a (drought, hurricane) I would _____

5. As far as my own life is concerned, God _____

6. The emotions I feel while I am going through a (drought, hurricane) are _____

IF NO EXPERIENCE WITH HAZARD: The emotions I would feel while I was going through a (drought, hurricane) would be _____

7. In a (drought, hurricane) the people I feel some responsibility for are _____

IF NO EXPERIENCE WITH HAZARD: In a (drought, hurricane) the people I would feel some responsibility for are _____

8. I believe that luck _____

9. When a (drought, hurricane) is over, I _____

IF NO EXPERIENCE WITH HAZARD: When a (drought, hurricane) was over, I would _____

10. When a community experiences a (drought, hurricane), the feelings among its people _____

IF NO EXPERIENCE WITH HAZARD: If a community experienced a (drought, hurricane), the feelings among its people would be _____

11. As far as the future is concerned, I _____

Guide to the Sentence Completion Test

The Sentence Completion is a test form which possesses four especially desirable properties as a method of gathering psychological data. First, the researcher can, by his choice of sentence stems, elicit responses from the subject which are directly relevant to the issues being investigated. Thus, for example, if one were interested in examining how young people perceive and interact with their parents, one might use sentence stems such as "I think my mother. . .," "My father and I. . .," "My feelings about my parents are. . .," etc.

Second, although the researcher thus directs the subject to particular concerns by way of his choice of sentence stems, he does not further constrain the subject's response. The subject is not forced to choose among a set of answers predetermined by the investigator. On the contrary, the stems allow for truly individual responses and thus for a variability of response unanticipated by the investigator.

Third, the test taps such free, open-ended responses in an economical manner. The stems generally elicit fairly brief responses -- sentence completions, not paragraphs or essays. Thus, the responses are simple in structure and content and their psychological meaning is relatively easily discernible.

Finally, the test lends itself to cross-cultural research because its technique embodies a universal characteristic of language structure -- the sentence. Thus, the task it imposes is understood everywhere.

The particular form of the test used here is designed to elicit responses relevant to three areas. First, the range of responses to the approach, occurrence and aftermath of a specific hazard experience is explored by stems 1, 4, and 9. Second, the emotions felt in response to experiencing a specific hazard are examined by stems 3, 6, 7, and 10. Third, the psychological dimension of internal versus external control (or, sense of self-direction versus sense of being controlled by powers outside the self, such as, God or fate or chance) is investigated by stems 2, 5, 8, and 11. The relevance of the behavior and feelings evoked by hazard experience or its anticipation to a study of the perception of, and adaptation to natural hazards is clear. And in pre-

vious research, the explicitly psychological factor - internal versus external control - has been found to possess considerable explanatory power as a correlate of hazard behavior; hence its inclusion.

In order to demonstrate how the test explores these three areas, some illustrations of completions to three stems will be presented. It is extremely important to realize that these illustrations are examples only, taken from a single site (Puerto Rico) and given in response to a single hazard (hurricane). They are, then, in no way to be construed as defining the limits of "acceptable" responses. Other sites and other hazards will of course result in other responses (and similar ones as well).

Examples

1. If a hurricane is predicted, I...
 - a. take all precautions necessary
 - b. listen to the radio and keep alert
 - c. become frightened
 - d. go to church and pray
 - e. am concerned about my wife and children
2. Getting ahead in the world results from...
 - a. hard work
 - b. ambition and drive
 - c. education
 - d. living a morally good life
 - e. knowing the right people
 - f. luck
 - g. faith in God
3. When a hurricane is coming I feel...
 - a. afraid
 - b. nervous
 - c. concerned over the possible loss of life
 - d. concerned over the possible destruction of property

Even these few examples show the test's power to evoke response revealing of the subject; that is, while focusing the subject's attention to a given issue, the stems are clearly sufficiently unstructured so as to allow the subject to construct a completion which is truly representative of himself. Thus, for example, note the decisively different types of responses given to stem 1; they range from the taking of objectively functional problem-oriented action to the simple expression of emotion.

As previously noted, the sentence completion test has been used successfully in cross-cultural research; its format travels well. However, the content of any particular variation of the test is vulnerable to the usual cross-cultural difficulties of conceptual relevance and translatability. In the test used here, it is anticipated that the ideas incorporated into two of the stems might possibly cause problems in some sites. The first of these is stem 2. By "Getting ahead in the world" is meant socially recognized success: that is, success (in whatever field a given culture may designate as important, such as, one's work, or in one's personal relationships) and social recognition of that success (by whatever means used in a given culture, such as, by increased wealth, fame, power, or honor).

The second stem which needs clarification is stem 5 which contains the term "God". As used here, "God" refers to the ultimate or first-in-importance determiner of the universe and man's destiny. To put it another way, "God" is used here in the sense of the expression "God wills it," or "It is the will of Allah."

The above elucidations of these two stems should make it possible for the investigator to decide first, if the concepts are appropriate to a given culture (that is, occur as part of its reality), and second, how they may best be translated. If conceptual difficulties are encountered with other stems they should be clarified through correspondence with the principal investigators.

Administration of the sentence completion test is quite easy. Usually, the brief and simple directions heading the test sheet are sufficient to make clear to the subject the nature of the task. Rarely, it may happen that a subject becomes confused over whether the "I" in the sentence stems refers to him or to the interviewer. In such cases, the interviewer should use examples of stems other than those in the test to clarify this point. Indeed, it is a general rule that the interviewer should never, for any purpose, use the actual test stems when giving examples of how the stems are to be completed as such illustrations might prejudice the subject's responses.

Occasionally, a subject may complete a sentence stem and then con-

tinue with an unnecessarily long response. The interviewer, with careful courtesy, can discourage this, perhaps suggesting that he will be eager for just such generosity later in the interview, but that for this particular test, such complex answers are not needed. The interviewer alone can decide if this is possible to do without giving offense; in some cases it may be wisdom to simply listen patiently. But the interviewer need record only the initial completion to the stem.

It is of greatest importance that the interviewer record the subject's responses verbatim, for the strength of the test resides in the richness of the individual data it evokes. For the same reason, it is crucial that interviewers take pains to report provincial uses of language. For example, in one site, the word normally translated as "light" was locally used to mean "quick". Without such instruction from the interviewer these responses would have been meaningless.

As is apparent in this brief guide, the extent to which the quality of data gathered depends upon the quality of the interviewer is considerable. The more secure and confident of his skill in administering the test, the better the data will be. Interviewers are encouraged to perform several trial administrations; problems which might be encountered can then be discussed and resolved prior to the actual data collection.

Format of Report

It is hoped that the materials may be prepared on 8 1/2 x 11" or 8 x 10" paper in a form which follows the order of:

Site description, including maps

Basic interview

Sentence completions

Rather than attempting to transcribe any of the data, it is desirable to photocopy the original forms as filled out by the interviewers.

NATURAL HAZARD RESEARCH

1. Ian Burton, Robert W. Kates and Gilbert F. White, The Human Ecology of Extreme Geophysical Events.
2. E. C. Relph and S. B. Goodwillie, Annotated Bibliography on Snow and Ice Problems.
3. J. M. Hewings, Water Quality and the Hazard to Health: Placarding Public Beaches.
4. James Kenneth Mitchell, A Selected Bibliography of Coastal Erosion, Protection and Related Human Activity in North America and the British Isles.
5. Mary Barker and Ian Burton, Differential Response to Stress in Natural and Social Environments: An Application of a Modified Rosenzweig Picture-Frustration Test.
6. Stephen Golant and Ian Burton, Avoidance-Response to the Risk Environment.
7. Stephen Golant and Ian Burton, The Meaning of a Hazard-Application of the Semantic Differential.
8. Kenneth Hewitt, Probabilistic Approaches to Discrete Natural Events: A Review and Theoretical Discussion.
9. Stephen M. Golant, Human Behaviour Before the Disaster: A Select Annotated Bibliography.
10. Clifford S. Russell, Losses from Natural Hazards.
11. Lesley Sheehan and Kenneth Hewitt, A Pilot Survey of Global Natural Disasters of the Past Twenty Years.
12. Kenneth Cypra and George L. Peterson, Technical Services for the Urban Floodplain Property Manager: Organization of the Design Problem.
13. Andris Auliciems and Ian Burton, Perception and Awareness of Air Pollution in Toronto.
14. Robert W. Kates, Natural Hazard in Human Ecological Perspective: Hypotheses and Models.
15. Myra R. Schiff, Some Theoretical Aspects of Attitudes and Perception.

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